

The Domino Effect of Design and Construction Defects in Supertall Towers

Floods, faulty elevators, and electrical explosions – these are just some of the complications that have arisen from construction and design defects reported at 432 Park luxury condominium in New York, one of the world’s most expensive addresses.

According to a [recent report](#) from The New York Times, residents of the supertall tower in Park Avenue are seeking \$125 million in damages through several claims in a lawsuit against the developers.

The damages include the costs of repairing around 1,500 construction and design defects that were identified by an engineering firm hired by the condo’s board.

The complaint, filed with New York State Supreme Court, reported defects in a number of interconnected systems in the building, many of which present “life safety” issues.

Referring to damages that may yet be uncovered, representative of the condo board, Jonathan Adelsberg claimed “It’s almost like peeling an onion.”

Even small design and construction defects can have huge consequences later down the line, and this becomes more apparent in supertall towers...

The domino effect

As we have learned, defects in construction or design may not reveal themselves in the first instance, but even if they are spotted, are they being dealt with adequately?

Residents of 432 Park have endured many repair works after the defects have led to numerous leaks and floods, noisy building sway, faulty elevators and more.

In the unfortunate case of these Supertall Towers, the developers took the ‘fix it when broken’ approach to the situation.

While attempting to patch a leak on a sub-level of the building, a contractor mistakenly drilled into electrical wiring, causing an explosion, which then knocked out the power for some residents, and shut down the air-conditioning system. The repairs cost more than \$1.5 million.

How to avoid these issues in current and future developments?

The answer – Inspection technologies and preventative maintenance.

Here are 10 ways inspection tech can preserve and secure the safety of our built environment and prevent this domino effect of damages from design and construction defects:

1. Efficient project management from the start

Thankfully, time-consuming paper and pen inspections are fast becoming a thing of the past. Visual inspections have evolved from a clipboard to a tablet device with [intelligent inspection software](#), where all findings can be kept securely and accessible to all project members. All project data can be stored in one place for greater efficiency and no risk of it getting lost. This way, any defects from the design or construction can be recorded digitally and dealt with before they become big problems.

2. Collecting data and reporting becomes more streamlined

With several types of non-destructive sensors and powerful inspection software available, collecting data and creating actionable reports has never been more streamlined. Technologies such as [ground penetrating radar](#) (GPR), [Ultrasound](#), [Rebound technology](#) and Eddy Current are now fully portable and digital with an efficient workflow to give the deepest insights into the condition and defects of the built environment. Reports can be created and shared within seconds. Photo reporting is also more efficient with software to capture any visual defects, and everything can be found again easily.

3. Advanced data analytics and visualization

[Data analytics](#) from several sources doesn't just help you to see what has happened, it also helps you to see what could happen in future by giving a bigger picture of the situation. The data collected, can be viewed in augmented reality and developed into 3D reality replicas of the building along with all the underground pipes and cables. Inspection technology could have saved the contractor from accidentally drilling into electrical wires. It saves thousands of contractors from striking hidden utilities every year! To stop the domino effect, clear data analysis and visualization must be at the core to make informed decisions.

4. Reliable structural health monitoring

Monitoring the structural health of our built environment is more than just installing sensors and collecting data. To gain a holistic overview, it takes a combination of approaches and technologies for both visual and non-destructive testing (NDT). Furthermore, inspection technologies are now integrating machine learning and artificial intelligence, enabling systematic comparison of historical reports to track defect development.

5. Significantly reduce costs and limit liabilities

In the past, building inspections could take many hours without the right equipment. Now, there is [specialized software with templates](#) that are regulated for each country and easy to fill in on the go. And with user-friendly and portable sensors, the number of people needed on the job is reduced. Less manpower and less time equal significantly reduced costs. Furthermore, with everything recorded digitally in one place, it helps with insurance evaluations, limiting liabilities and resolving issues within the recommended time frame.

6. Enforced transparency for asset owners, board members and residents

Inspection software with fast reporting and collaboration features means that project members don't have to wait many days or weeks to find out the results of the inspection, they can have it on the same day. That way, everyone is kept in the loop, even in real time if required! Notes, drawings, photos, videos, even messages about the project can all be kept together securely and accessible at any point in time. This level of transparency with data is key to preserving our built environment for decades to come.

7. Priorities for repairs are easier to manage

Sometimes the sheer number of repairs needed becomes too much to manage. Especially if the domino effect has truly taken over. How to know which priorities should be managed first? With efficient inspections and intelligent software, defects can be captured, analyzed and prioritized in terms of minor issues that may cause big problems later on, which must be repaired immediately, and which need more frequent monitoring. The findings can even be color coded to see easily which defects to focus on first.

8. Preventative maintenance becomes possible

With [advanced data collection](#) and analytics combined with technologies such as machine learning, preventive maintenance is now not just a possibility, but a necessity. Technology allows you to see what our eyes cannot and with that data it's possible to build a history of the asset, and a preventive maintenance strategy for the future. Furthermore, Inspection technology also lets you determine if a repair has been carried out correctly.

9. No risk of data loss and less risk of collecting 'bad data'

Only a few short years ago, paper, pen and clipboard ruled the inspection industry. The collected data would need to be processed back at the office and then transferred to a USB stick to share with project members. This method brings huge risk of data loss over the years as USB sticks and paper forms become lost. In the past, it was not so clear whether the data collected was useable or not until after the inspection was complete. This often meant that work was having to be redone several times. Thankfully that is no longer the case with modern inspection technologies. Now you can visualize the data immediately with all processing done on site and [significant time and costs savings](#). Everything is saved securely with back up copies to eliminate risk of data loss.

10. Value of assets is increased

Assets such as buildings, towers and bridges with up-to-date inspection data is beneficial to all current and future parties involved. Buyers and residents feel safer with the transparency, and the asset increases in value with regular inspections and maintenance. Like when purchasing a car, we like to know its maintenance history. Inspection technology allows us to build detailed structural health records for assets that are valuable to buyers and residents alike.

As you can see, leveraging inspection technology, utilizing the data and acting before minor issues become big problems significantly helps to preserve the health of our built environment.

Interested to know which would be best for your requirements? [Get in touch](#), our team would be happy to help discuss options and answer your questions.



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